

Quiz:

True or false: the dominant higher ranking animals always have higher level of stress hormones.

True or false: the subordinate animals usually have lower level of stress hormones.

What is Animal Cognition?

What is cognition?

WHO TAUGHT THE RAVEN IN A DROUGHT TO
THROW PEBBLES INTO A HOLLOW TREE, WHERE
SHE ESPIED WATER, THAT THE WATER MIGHT
RISE SO AS SHE COULD COME TO IT?

Francis Bacon, 1605



Thomas Bewick

*Select Fables of
Aesop and others,
1784*

FABLE XLVIII.

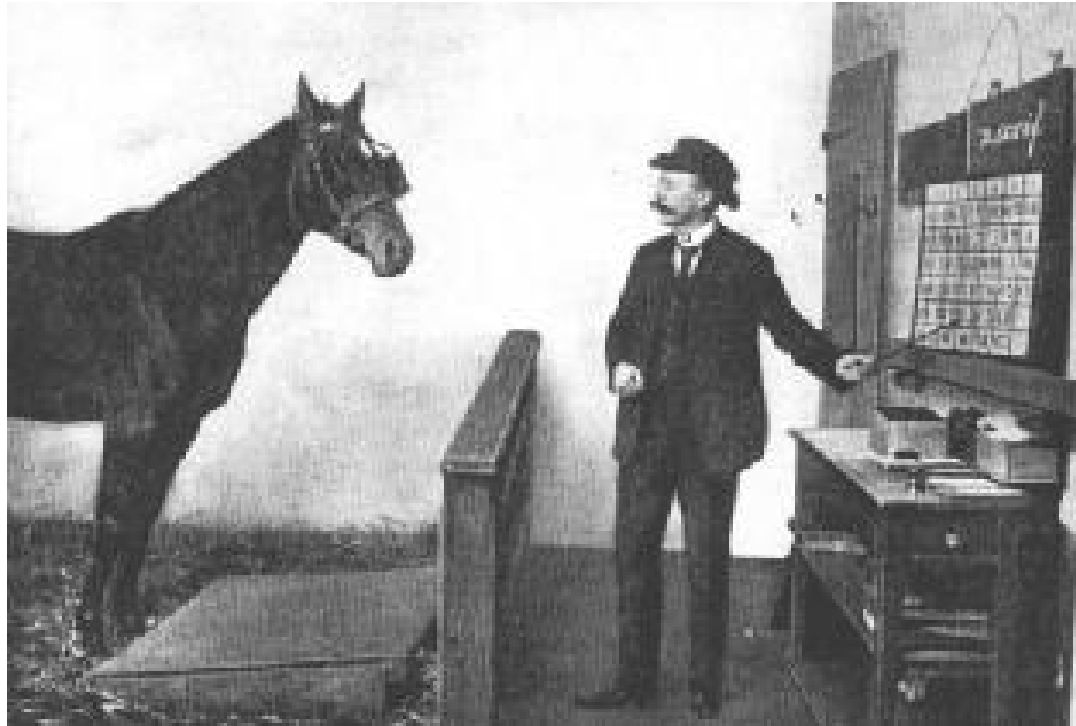
The Crow and the Pitcher.

A CROW, ready to die with thirst, flew with joy to a pitcher which he beheld at some distance. When he came, he found water in it indeed, but so near the bottom, that with all his stooping and straining, he was not able to reach it. Then he endeavoured to overturn the pitcher, that so at least he might be able to get a little of it; but his strength was not sufficient for this. At last, seeing some pebbles lie near the place, he cast them one by one into the pitcher; and thus, by degrees, raised the water up to the very brim, and satisfied his thirst.

Now, scientists have proved the crow can use tools to get the food..



Clever Hans



In late 1800s, a German mathematics professor, Von Osten, firmly believed that humanity had greatly underestimated the reasoning skills and intelligence of animals. He tested his idea with his horse, Hans.



“What is the square root of sixteen?” Four taps.

“What is the date of the following Monday?” Six hoof-taps .

89% accuracy.

Hans’ grasp of mathematics was equivalent to a fourteen-year-old’s.

However,

If the questioner to stand farther away, something interesting happened: the horse's accuracy diminished.

Or, if the questioner didn't know the answer to a question in advance, the accuracy of Hans' responses plummeted to nearly zero.



Hans was merely being receptive to the subtle, unconscious cues which were universally present in his human questioners. There is evidence to indicate that horses may possess an enhanced sensitivity to inconspicuous body language, perhaps as a key part of their social interactions with other horses.

What do you learn from this Clever Hans's story?

1. Horses are smart in their own way.
2. Careful to do science.

The Blue tits and the milk bottles





Are blue tits so smart?

Exercising a combination of insight
and planning;
Saw an opportunity and exploited it.



Are blue tits so smart?

Or this behavior is part of their daily routine behavior, but they accidentally apply it to the bottle, and it works.



Animals are most
“intelligent” to best
adapt to its local
environment.



Take home message:

Understand animal's natural behavior is essential to study their intelligence or mind.

Study of animal mind:

Invertebrates

Foraging behavior of honey bees

Waggle dance...

Study of animal mind

invertebrates

Altruism behavior of eusocial insects

Study animal cognition:

Use social species:

altruism; sympathy

Some examples:

Dolphins keep injured members of the group afloat.

Vampire bats share food (blood) with starving members of their colony.

Alarm calls of ground squirrels

Elephants mourns for the death of young or elder for weeks or months.

Food sharing in blood-sucking vampire bats

Tit for tat strategy



Female bats regurgitate blood meals to others that failed to obtain food

Elephants mourn the dead



Hippo's empathy



Altruism or sympathy
require animals to understand
a great deal about social relationship
and group dynamics.

→ Individual understand and then
manipulate or trick each other.

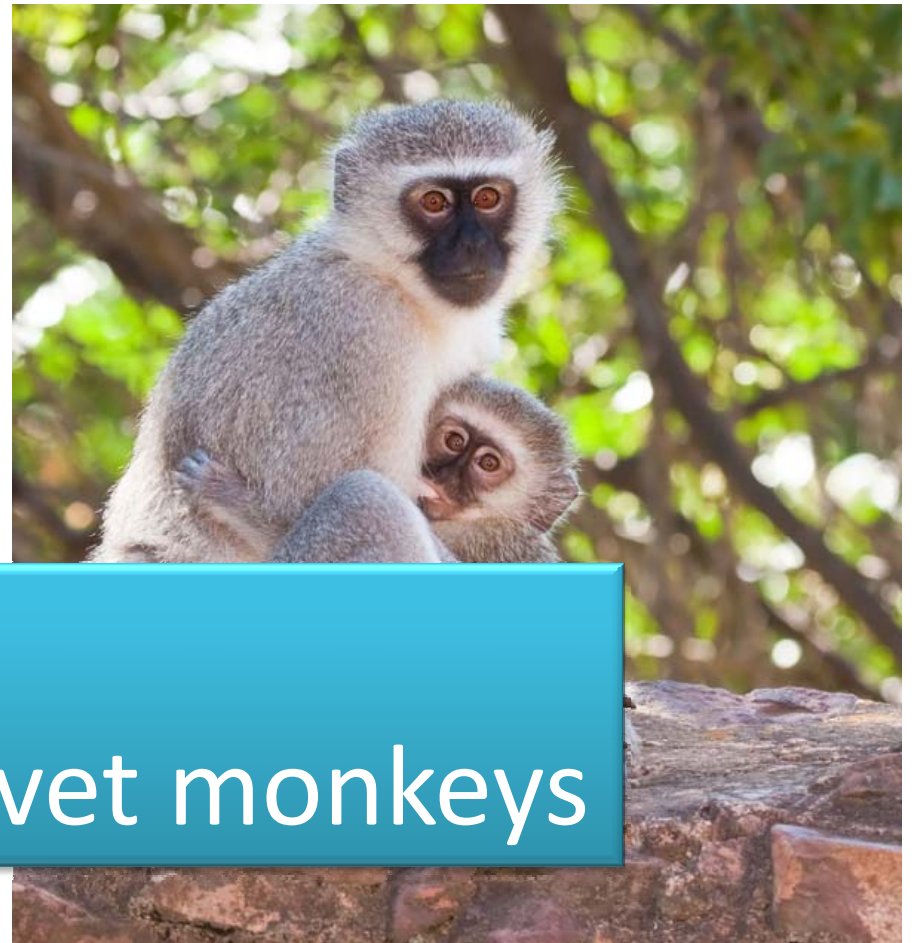
→ Show some degree of **self-awareness** ?

Social animals understand a great deal about social relationship and group dynamics.

Example #1:
Alarm calls of Ground squirrels



Social animals understand a great deal about social relationship and group dynamics.



Example #2:
Alarm calls of Velvet monkeys

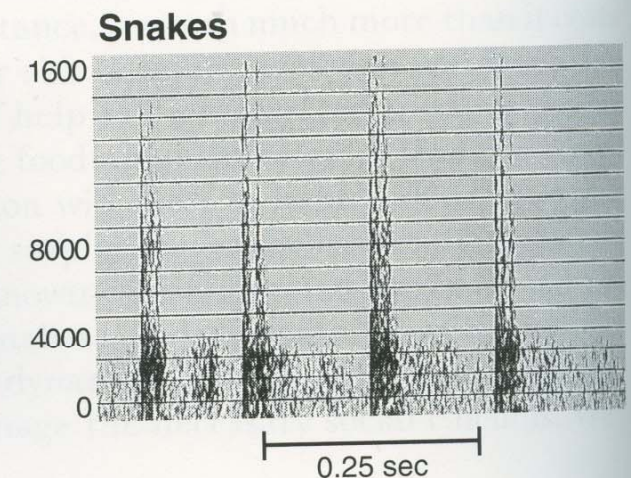
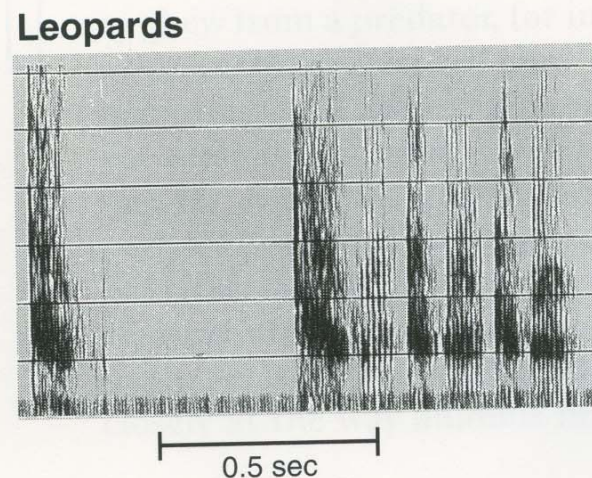
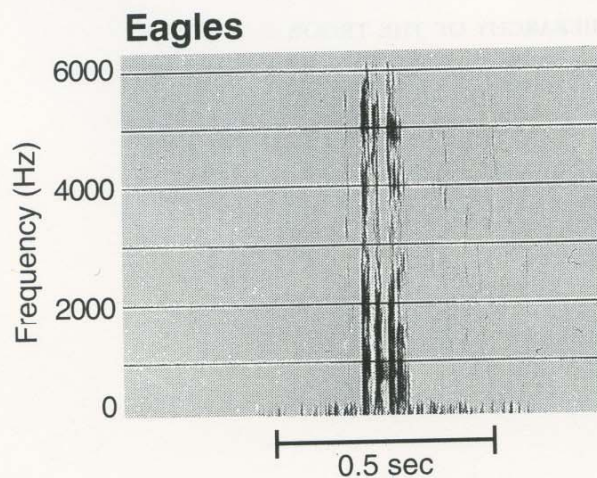
Velvet monkey: four alarm calls

#1: for aerial predators (Eagles)

#2: for terrestrial predators (Leopards)

#3: for snakes

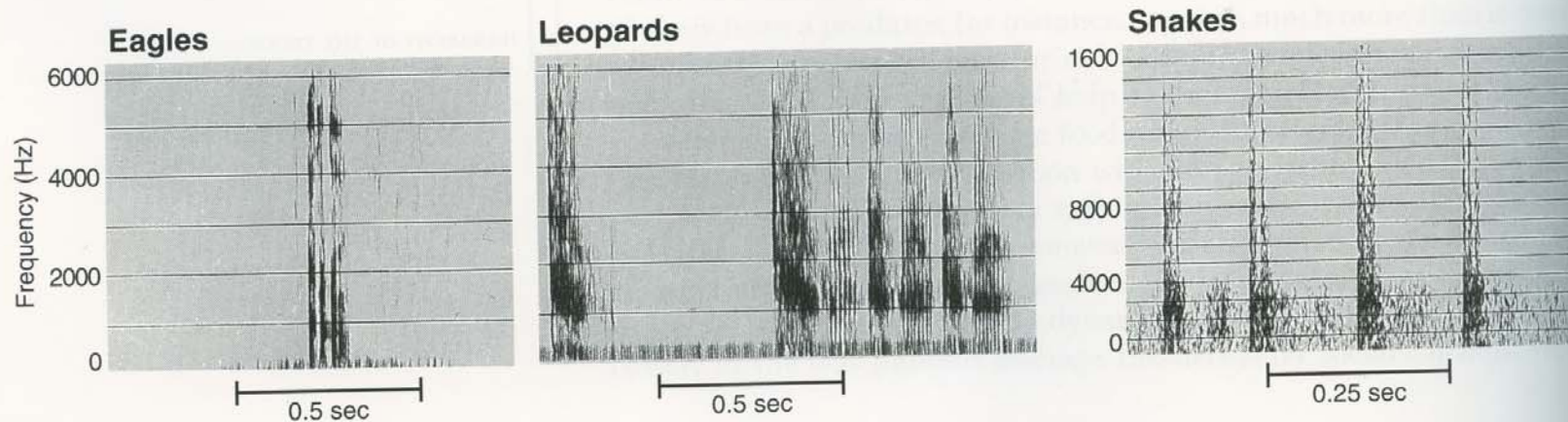
#4: for group-hunting predator.



All of the calls are **innately** produced
and **innately** recognized

But juveniles still have to learn from adults
what is the real threat.

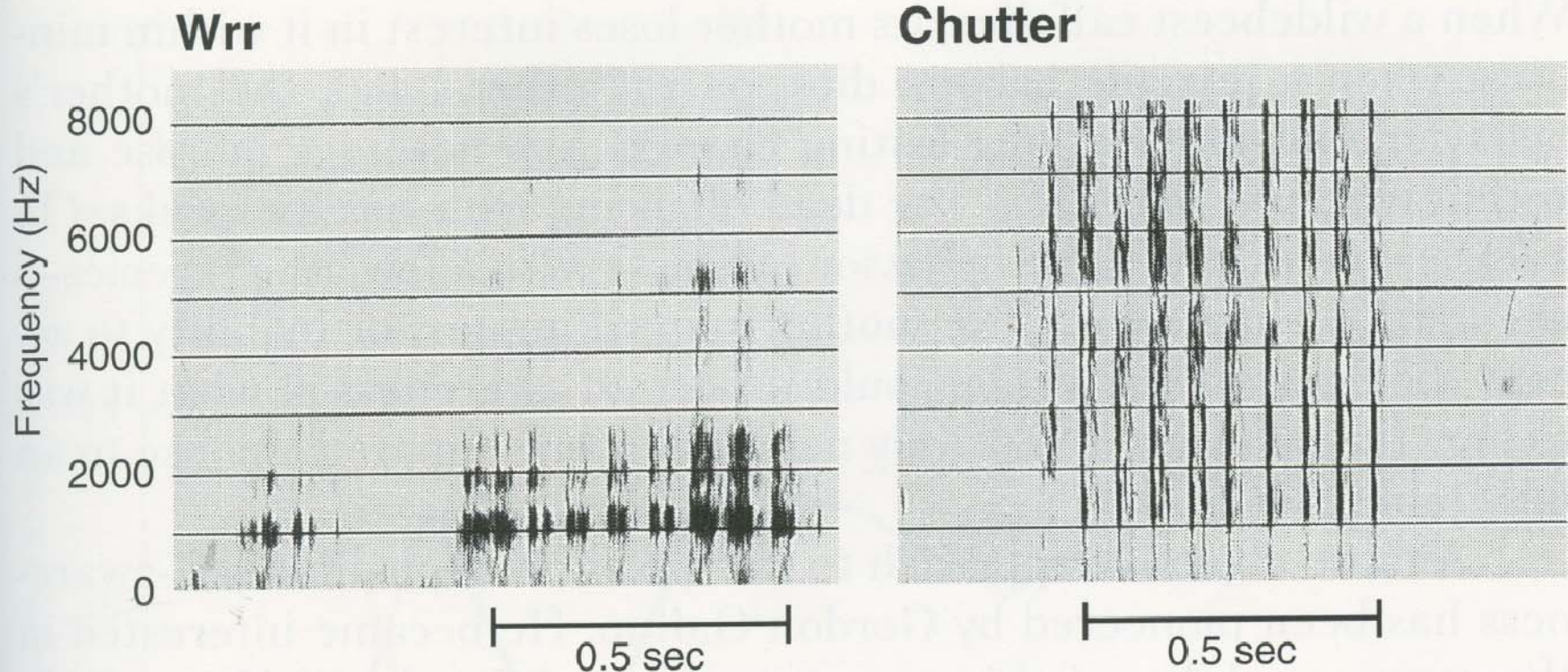
They understand exactly what each call means,
How credible each caller is.



Velvet monkey: two other calls

#1: Wrr call: signals the initial sighting of another group

#2: Chutter call: serious signals that induces more aggressive interaction



Group members have different responses toward these calls dependent on who is the caller.

They understand their own and on another's social standing and adjust their behavior accordingly.

But, does this imply the monkeys have a **self-image**?

Self-Image (self-awareness)

